

# US TC Activity

- ◆ **US Involvement in TC – Background.**

- ◆ **TC and TMB Organization**

- ◆ **TC Project Office**

- Schedules
- QA
- Management tools
- Review Office

- ◆ **US Integration/Engineering Efforts:**

- Engineering Help**

- Engineers @ CERN**

- Project Office**

- Configuration Control**

- Position for an Integration/Installation Eng.**

- Engineering in the US**

- Configuration Control - Envelopes.**

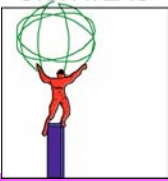
- Access**

- Movements/Installation**

- Beam Pipe – Pixel Installation and interface**

- ◆ **TMB organization**

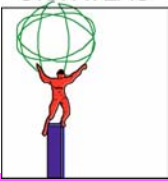
- ◆ **Future Plans**



# US Involvement - Background

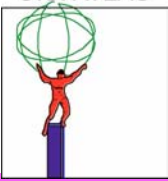


- ◆ *TC efforts have traditionally been based and centered at CERN ( ~ exclusively).*
- ◆ *The ATLAS MOU's specify deliverables to the systems and common funds items. The "deliverables" are typically a component (e.g. Cryostat) that is built to the ATLAS specification.*
- ◆ *TC Engineering/Physicist manpower was assumed (by most collaborators) to come from CERN.  
CERN expected the effort to be shared by the whole collaboration.*
- ◆ *Most institutions/funding agencies find that their MOU deliverables saturate their resources and have little or no resources available for for TC.*
- ◆ *The US had (have) the opinion that unless a significant strengthening of TC (both Engineering and Physicists) took place, ATLAS risks significant delays and problems when installation and commissioning stage starts.*



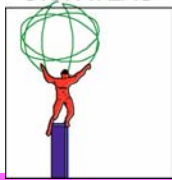
## ***“New TC” – US View***

- ◆ *In the Middle of '00 Mike Price decided due to health reason to step down. P. Jenni/ATLAS management started to look for a new TC. At the same time G. Bachy (Chief Eng.), W. Witzeling (Deputy TC) also left ATLAS.*
- ◆ *Positive interactions with M. Nessi who was thinking about becoming TC. Found common concerns and the need to strengthen TC.*
- ◆ *Before formal appointment Marzio developed the new organization frame work for TC. The main ideas were:*
  - *“projectize” TC activities.*
  - *Strengthen the TC in manpower*
  - *Establish a well define ATLAS baseline*
    - ◆ Envelopes
    - ◆ Schedule
    - ◆ Movements, Survey needs etc.
  - *Review process that tracks performance relative to the baseline for the systems.*



# US Involvement

- ◆ *US formal involvement in TC started in early '01. We got Project funds were allocated to support TC activities in the US and at CERN.*
- ◆ *D. Lissauer accepted to be Activity A manager in the new TC. Activity A is defined as the “Project Office”.  
(See earlier presentation)*
- ◆ *As the new TC organization is taking shape it is important to find the best way to utilize US resources to help in the implementation of the plan.*
- ◆ *US should make significant contribution in critical areas.  
The overall scale of US contribution is small but can be (needs to be) effective.*
- ◆ *US advantages:*
  - ◆ *Utilize existing expertise in the US.*
  - ◆ *Flexibility in funding.*

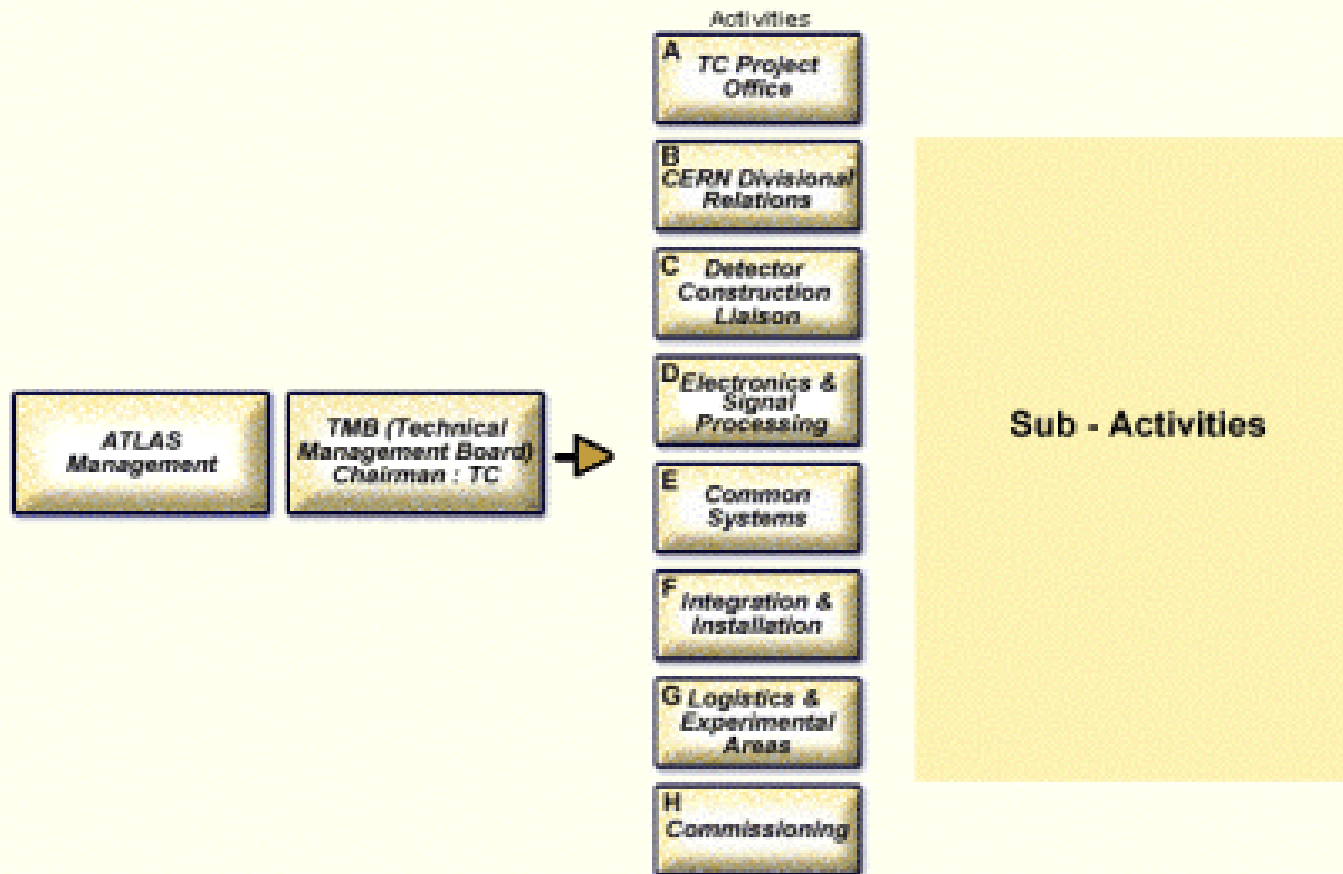


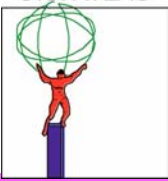
# TC Organization

## Technical Coordination Organization

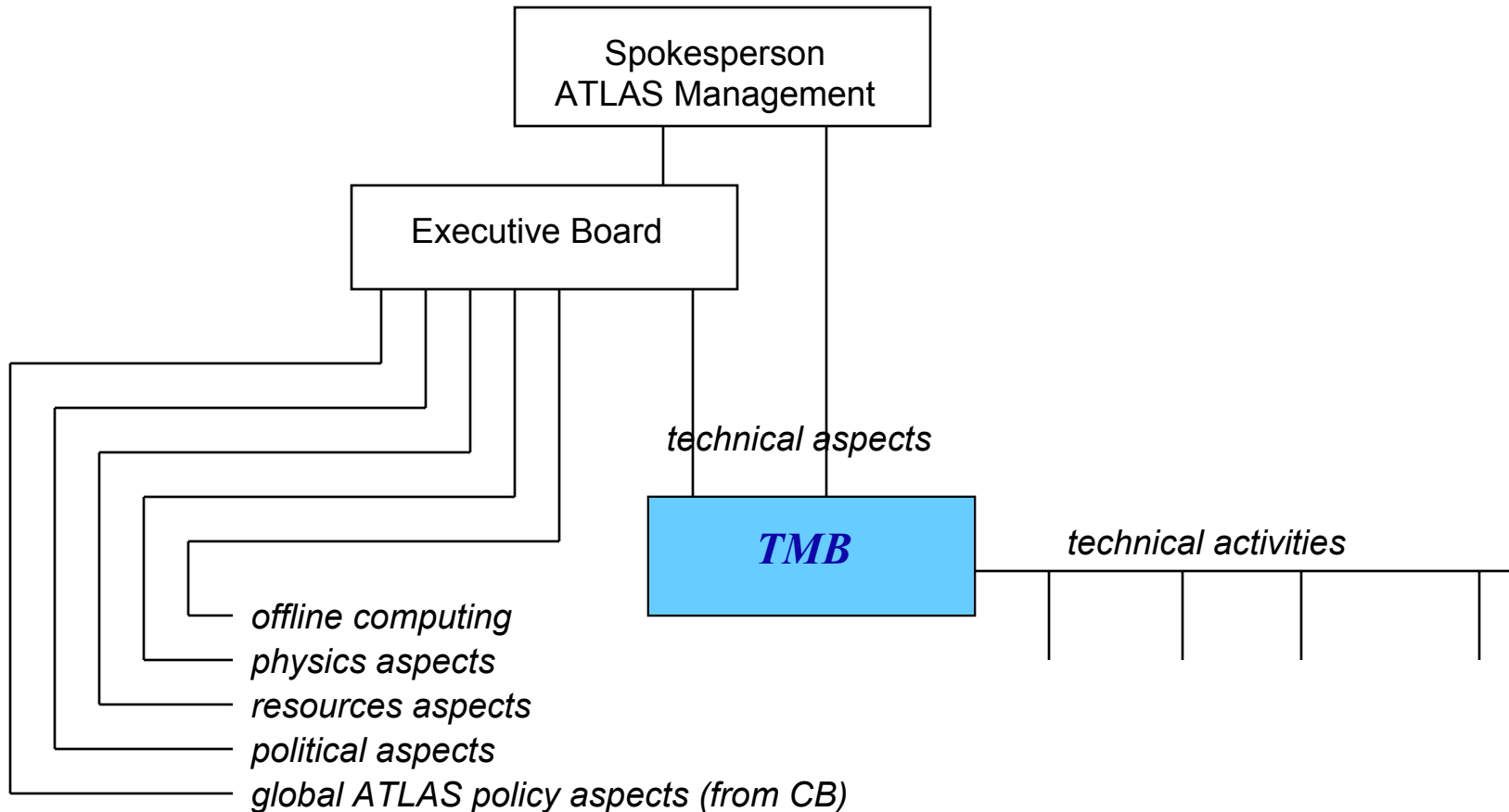
- [Reference Document](#)

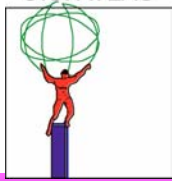
ATLAS TC Documentation Center





# Technical Management Board (TMB)





# TC project Office

- Activity A - Mandate

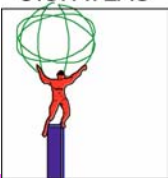
	Responsible	Web Page	Agenda & Minutes	Work Package	Action List
→ TC Project Office	<a href="#">D. Lissauer</a>			<a href="#">TC-W012</a>	
Schedules & Milestones	<a href="#">M. Kotamaki</a>	<a href="#">Click</a>		<a href="#">TC-W001</a>	
Resources	<a href="#">P. Schmid</a>	<a href="#">Click</a>		<a href="#">TC-W016</a>	
→ Management Tools	<a href="#">F. Dittus</a>	<a href="#">Click</a>		<a href="#">TC-W003</a>	
→ QA Office	<a href="#">H. Schmuecker</a>	<a href="#">Click</a>		<a href="#">TC-W014</a>	
Glimos - Safety	<a href="#">G. Benincasa</a>	<a href="#">Click</a>		<a href="#">TC-W013</a>	
→ Review Office	<a href="#">B. Szeless</a>	<a href="#">Click</a>		<a href="#">TC-W015</a>	

This is the core of the TC activities, where tools and rules are worked out

One of the main goals is to convince the collaboration to adapt certain standards and procedures, which should allow to treat the various parts of the construction work in a similar way in term of documentation, follow-up, schedules,...

(US: D. Lissauer and K. Pommes (US Support))

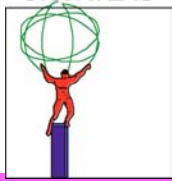
- ◆ PPT Implementation
- ◆ Documentation Center on the Web
- ◆ ECR
- ◆ Installation Data Base



# Schedules & milestones

	Baseline Schedules (incl. EB & LHCC milestones)			Detailed Schedules		Work- packages in the PPT	Scheduling contact person
	Files	Ver	Last update	Files	Last update		
<b>Vacuum Beam</b>	<a href="#">MPP</a> <a href="#">PDF</a>		15 Dec '00				<a href="#">R. Veness</a>
<b>Inner Detector</b>				<a href="#">ATL-I-SD-0001</a>	14 Mar '00	<a href="#">ID WPs</a>	<a href="#">G. Tappern</a>
Pixel	<a href="#">MPP</a> <a href="#">PDF</a>		15 Dec '00				<a href="#">L. Rossi</a>
SCT	<a href="#">MPP</a> <a href="#">PDF</a>		15 Dec '00				<a href="#">M. Tyndel</a>
TRT	<a href="#">MPP</a> <a href="#">PDF</a>		15 Dec '00				<a href="#">D. Froidevaux</a>
Common Items	<a href="#">MPP</a> <a href="#">PDF</a>		15 Dec '00				<a href="#">G. Tappern</a>
<b>Solenoid Magnet</b>	<a href="#">MPP</a>	v1	18 Apr '01				
<b>LAr Calorimeter</b>						<a href="#">LAr WPs</a>	<a href="#">P. Fassnacht</a>
LAr Barrel	<a href="#">MPP</a> <a href="#">PDF</a>		15 Dec '00	Draft for a new baseline schedule: <a href="#">MPP</a> <a href="#">PDF</a>			
LAr End-Cap	<a href="#">MPP</a> <a href="#">PDF</a>		15 Dec '00	Draft for a new baseline schedule: <a href="#">MPP</a> <a href="#">PDF</a>			
LAr Proximity Services	<a href="#">MPP</a> <a href="#">PDF</a>		15 Dec '00				
LAr Electronics	<a href="#">MPP</a> <a href="#">PDF</a>		15 Dec '00				
<b>Tile Calorimeter</b>	<a href="#">MPP</a> <a href="#">PDF</a>	v1	8 Jan '01	<a href="#">Tile Cal Scheduling Page</a>		<a href="#">Tile WPs</a>	<a href="#">R. Leitner</a>
<b>Toroid Magnet</b>					22 Oct '00	<a href="#">Toroid WPs</a>	<a href="#">P. Miele</a>
Barrel Toroid	<a href="#">MPP</a> <a href="#">PDF</a>	v1	18 Apr '01				





# TC – Mechanical Integration

*From M. Nessi, M. Hatch and O. Beltramello one of the priorities that TC had to address was the establishment of an ATLAS baseline and configuration control.*

*Since the beginning of '01 an large amount of work has been done by a small team of people. US contribution there was critical. We have two senior Cad Designers working in Olga's team.*

Senior CAD designer **T. Klioutchnikova:**

*(Supported at CERN)*

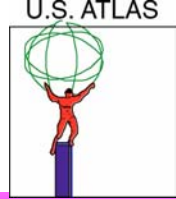
- Systems envelope review leader
- follow up of CAD designers
- information recovery for detailed envelope review / discussions with systems
- conflicts checking and resolution
- Gap task force associated drawings

Senior CAD designer **S. Norton:**

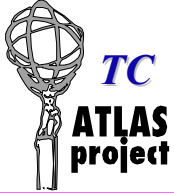
*(at BNL)*

- CDD drawings verifications
- Access drawings

In addition S. Norton worked on US specific integration Issues. (Calorimeter Survey, Muon Survey, CDD drawings for Cryostat and Muons)



# ***Installation – Access Studies***



***Access is one of the main problems in the ATLAS experiment.***

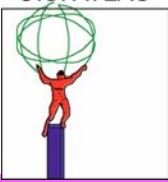
- ***Difficult geometry.***
- ***Activation problems due to LHC Luminosity.***
- ***Significant amount of electronics inside the detector.***

***Access for servicing an important issue***

- ***ACCESS STUDIES***
- ***FIXED STRUCTURES***

***Anatoli Gordeev – work with Tommi Nymann on Access Scenarios and tooling***

***(Still some obligation to CSC's. – Expect to be finished with this soon)***



# Movements

## ***MOVING SYSTEMS:***

***Design of the moving systems (HF trucks, Air pads, Hydraulic cylinders, Process controls, hydraulic systems).***

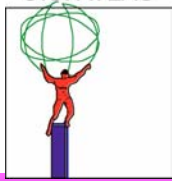
***Take the engineering from the design phase through to procurement and installation and commissioning.***

***B. Stanek (Physicist) is coordinating the project at ANL:***

***One Engineer at ANL (Vic Guarino) to work on Movements/Cal interfaces.***

***Work Packages are being defined.***

***Work will be split between ANL, CERN and ORSAY.***



# Muon Integration

*Forward System is one of the more complicated systems in ATLAS.  
(See Forward Task Force)*

*Jim Bensinger is working on the Muon Alignment system.*

*This is closely associated with the overall problems of Muon Forward integration*

*Jim has agreed to act as a Forward Liaison between TC and the Muon system*

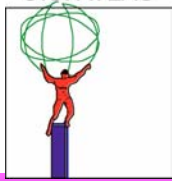
*First questions that are being attacked:*

*Envelope conflicts with the alignment system.*

*Rails*

*Wheel Structures*

*Survey targets positions on chambers*



# ***Radiation Studies – Forward region Optimization***

◆ ***Mike Shupe is leading this part of the US effort.***

**Vincent Hedberg is the TC responsible for the ATLAS shielding.**

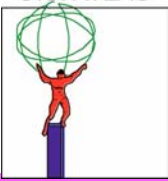
**A new re-optimization of the Shielding is underway it includes:**

◆ **Optimization of ATLAS shielding**

◆ **Muon Backgrounds**

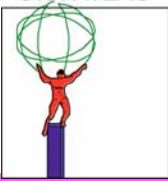
◆ **Activation Studies**

- **Mike Shupe studies are critical for this re-optimization.**
- **US-ATLAS computing Cycles (~ 50%)**



# Major Changes

- ◆ **GAP Task Force:** Increase the GAP between the Barrel and EC by ~40 mm.  
32 mm for ID services, increase in stay clear area.  
Move ID Patch Panels behind Muon Chambers layer 1
- ◆ **Z/R Envelopes:** Increase all the Stay Clear Areas between moving systems.  
Fix Big Wheel Envelopes.  
Toroid Nominal radius to be increased by 25 mm
- ◆ **Shielding:** Major Changes in the shielding configuration.  
Simplification in design and major weight reduction with no loss of performance.  
New Design for the Forward Shield.
- ◆ **New Pixel/Beam installation scenario:**
- ◆ **Access Studies:**
- ◆ **Movement Studies:**



# Summary

## *US Physicists Involved in TC:*

- |                     |  |
|---------------------|--|
| <i>D. Lissauer</i>  | <i>- TC Activity A, Placement Strategy (BNL)</i> |
| <i>M. Shupe</i>     | <i>- Radiation/Activation Studies (Arizona)</i>  |
| <i>J. Bensinger</i> | <i>- Forward Muon Integration (Brandise)</i>     |
| <i>B. Stanek</i>    | <i>- Movements (ANL)</i>                         |

## *TC Support @ CERN:*

- |                          |  |
|--------------------------|--|
| <i>K. Pommès</i>         | <i>Project Management – Eng.</i>       |
| <i>T. Klioutchnikova</i> | <i>Senior Designer – Conf. Control</i> |
| <i>Add. Eng. @ CERN</i>  | <i>Services -</i>                      |

## *BNL:*

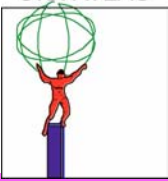
- |                   |  |
|-------------------|--|
| <i>S. Norton</i>  | <i>Senior Designer – Conf. Control</i> |
| <i>A. Gordeev</i> | <i>Engineer - Access</i>               |

## *ANL:*

- |                   |                            |
|-------------------|----------------------------|
| <i>V. Guarino</i> | <i>Movements/FEA Calc.</i> |
|-------------------|----------------------------|

## *LBL:*

- |                    |                              |
|--------------------|------------------------------|
| <i>E. Anderson</i> | <i>Pixel/Beam Interface.</i> |
|--------------------|------------------------------|



# Conclusions

## ◆ TC organization is taking shape.

*TC is being strengthened – but at a slower rate than we hoped.  
There are good signs that other collaborators are putting TC activities on a higher level. (More is needed)*

## ◆ US effort is effective.

*Areas for US contributions have been identified.*

*Engineers have been identified both at CERN and in the US to strengthen these areas.*

*Physicists involvement is increasing.*

*The US has a critical role in TC and effort should increase to make sure that ATLAS is successful.*

*The U.S. will definitely need to continue its involvement in the Maintenance and Operations Phase of the experiment. This will guarantee a cost effective overall U.S. contribution to M&O.*